ORDER NO. SD7905-1561

Service Manual

SL-D2/K

Turntable System

SL-D2

(XA), (XAL), (XGE), (E)

(XG), (XGF), (XGB)

SL-D2K

(XAL), (E), (XG), (XA)

* The models SL-D2 (XA) and SL-D2K (XA) are available in Asia, Latin America, Middle East and Africa only.
* The Models SL-D2 (XAL) and SL-D2K (XAL) are available in Australia only.
* The model SL-D2 (XGE) is available in United Kingdom only.
* The models SL-D2 (E) and SL-D2K (E) are available in Scandinavia and European only.
* The models SL-D2 (XG) and SL-D2K (XG) are available in European only.
* The model SL-D2 (XGF) is available in France only.
* The model SL-D2 (XGB) is available in Belgium only.
* SL-D2 is of silver finish.
* SL-D2K is of black finish.

SPECIFICATIONS (Specifications subject to change without notice.)

General

Power supply:	~110-120/220-240V, 50 or 60 Hz
Power consumption:	4,5 W
Dimensions: (W x H x D)	43.0 x 13.0 x 37.5 cm (16-59/64" x 5-7/64" x 14-40/64")
Weight:	6.9 kg (15.2 lb.)

Turntable section

Type:	Automatic turntable Auto return Auto stop
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	B·FG servo control
Turntable platter:	Aluminum die-cast, 31.2cm (12-9/32")
Turntable speeds:	33-1/3 rpm and 45 rpm
Pitch control:	10% adjustment range
Wow and flutter.	0.014% WRMS* 0.03% WRMS (JIS C5521) ±0.042% peak (IEC 98A Weighted)

*The rating refers to turntable assembly alone, excluding efects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from frequency generator attached to motor assembly.

Rumble:	–53dB(IEC 98A Unweighted) –75dB(ICE 98A weighted)

Tonearm section

Type:	Universal tonearm
Effective length:	230 mm (9-1/16")
Overhang:	15 mm (19/32")
Friction:	Less than 7mg (lateral, vertical)
Effective mass:	12g (without cartridge)
Tracking error angle:	Within 2°32' at the outer groove of 30cm (12") record Within 0°32' at the inner groove of 30cm (12") record
Offset angle:	22°
Stylus pressure adjustment range:	0–2.5 g
Applicable cartridge weight range:	6–9.5 g 13.5–17 g (including headshell)
(with shellweight):	3–6.5 g 10.5–14 g (including headshell)
Headshell weight:	7.5 g

Cartridge section

Model No.	EPC-270C
Type:	Moving magnet
Frequency response:	20 Hz to 25 kHz
Output voltage:	3.2 mV at 1 kHz 5 cm/s. zero to peak lateral velocity
Output voltage:	[9 mV at 1 kHz 10 cm/s. zero to peak 45° velocity(DIN 45 500)]
Channel separation:	25 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Compliance (dynamic):	10×10^{-6} cm/dyne at 100 Hz
Stylus pressure:	1.75 ±0.25g (17.5 ±2.5mN)
Load impedance:	47 kΩ to 100 kΩ
Weight:	6.0 g (cartridge only)
Replacement stylus:	EPS-270SD

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SL-D2/K

TECHNISCHE DATEN (Änderungen der technischen Daten vorbehalten.)

Allgemeine Daten

Stromversorgung: ~110-120/220-240 V, 50/60 Hz Wechselstrom
Liestungsaufnahme: 4,5 W
Abmessungen (B x H x T): 43,0 x 13,0 x 37,5 cm
Gewicht: 6,9 kg

Plattenspieler

Typ: Automatischer Plattenspieler
Rückführautomatik
Stopautomatik
Antrieb: Direktantrieb
Motor: Kollektorloser Gleichstrommotor
Antriebsregel-Methode: Gegen-EMK-FG-Servo-Steuerung
Plattenteller: Aluminium-Spritzguß, 31,2cmø
Plattenteller-Drehzahlen: 33-1/3 und 45 U/min
Drehzahl-Feinregulierung: 10% Einstellbereich
Gleichlaufschwankungen: 0,014% WRMS*
0,03% WRMS (JIS C5521)
±0,042% Spitze (IEC 98A bewertet)

* Diese Nennleistung bezieht sich auf das Laufwerk-Bauteil allein, ausschließlich Einflü sse von Schallplatte, Tonabnehmer oder Tonarm, aber einschließlich Plattenteller.
Gemessen anhand von Signalen vom Frequenzgenerator, der an das Motorbauteil angebaut ist.

Rumpel-Geräusch-spannungsabstand: –53 dB (IEC 98A unbewertet)
Rumpel-Fremd-spannungsabstand: –75 dB (IEC 98A bewertet)

Tonarm

Typ: Universal-Tonarm
Effektive Länge: 230 mm
Überhang: 15 mm
Lagerreibung: Weniger als 7 mg (horizontal, vertikal)
Effective Masse: 12 g (ohne Tonabnehmer)
Spurfehlwinkel: 2°32′ bei der Einlaufrille einer 30 cm-Platte
0°32′ bei der Auslaufrille einer 30 cm-Platte
Kröpfungswinkel: 22°
Auflagekraft-Einstellbereich: 0–2,5 g
Zulässiger Tonabnehmer-Gewichtbereich: 6–9,5 g
13,5–17 g (einschließlich Tonarmkopf)
(mit Zusatzgewicht): 3–6,5 g
10,5–14 g (einschließlich Tonarmkopf)
Tonarmkopf-Gewicht: 7,5 g

Tonabnehmer

Modell-Nummer: EPC-270C
Typ: Magnetischer Tonabnehmer
Frequenzgang: 20 Hz bis 25 kHz
Ausgangsspannung: 3,2 mV bei 1 kHz
5 cm/s. Null-zu-Spitze, lateral
[9 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
Kanaltrennung: 25 dB bei 1 kHz
Kanalabweichung: Innerhalb 2 dB bei 1 kHz
Nachgiebigkeit (dynamisch): 10 x 10^{-6} cm/dyn bei 100 Hz
Auflagekraft: 1,75 ± 0,25 g (17,5 ± 2,5 mN)
Impedanz: 47 kΩ bis 100 kΩ
Gewicht: 6,0 g (ohne Tonarmkopf)
Ersatznadel: EPS-270SD

CAPACITRISTIQUES TECHNIQUES (Les spécifications sont susceptibles d'être modifiées sans préavis.)

Généralités

Alimentation: Alternatif 110-120/220-240V, 50 ou 60 Hz
Consommation: 4,5 W
Dimensions:(L x H x P): 43,0 x 13,0 x 37,5 cm
Poids: 6,9 kg

Platine de lecture

Type: Platine automatique
Retour automatique
Arrêt automatique
Système d'entrainement: Entrînement direct
Moteur: Moteur C.C. sans balai
Groupe de réglage: Servocommande du générateur de fréquence de force contre-électro-motrice
Plateau de lecture: Aluminium moulé sous pression, 31,2 cm
Vitesses de rotation: 33-1/3 et 45 t/p.m
Réglage d'écart: Plage de réglage de 10%
Pleurage et scintillement: 0,014% WRMS*
0,03% de valeur efficace (JIS C5521)
±0,042% de crête (IEC 98A Pondéré)

La valeur nominale se réfere au plateau de lecture seul, excluant les effets provenant du disque, de la cellule pick-up, du bras de lecture, etc.
Mesuré par l'obtention du signal provenant du Générateur de Fréquences incorporé dans l'assemblage du moteur.

Ronflement: –53 dB (IEC 98A Non pondéré)
–75 dB (IEC 98A Pondéré)

Bras de lecture

Type: Bras de lecture universel
Longueur effective: 230 mm
Porte-à-faux: 15 mm
Frottement: Moins de 7 mg (latéral et vertical)
Masse réele: 12 g (sans la cellule pick-up)
Angle d'erreur de piste: En deçà de 2°32′ au sillon extérieur d'un disque de 30 cm
En deçà de 0°32′ au sillon intérieur d'un disque de 30 cm
Angle de décalage: 22°
Plage de réglage de la pression d'appui: 0–2,5 g
Gamme du poids de la cellule pick-up utillsable: 6–9,5 g
13,5–17 g
(y compris la coque porte-cellule)
(avec contrepoids de la cellule): 3–6,5 g
10,5–14 g
(y compris la coque porte-cellule)
Poids de la cellule: 7,5 g

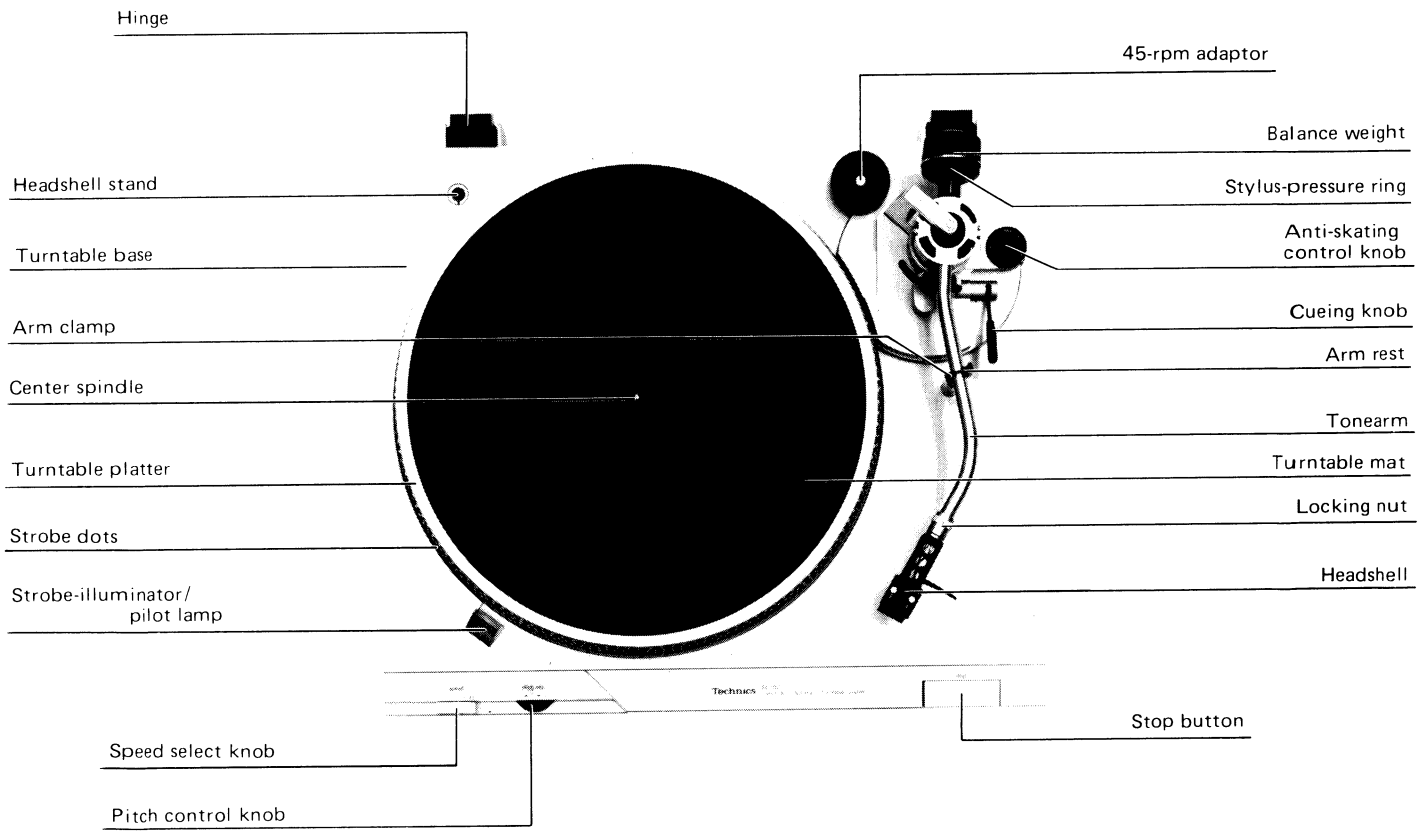
Cellule pick-up

No. du modèle: EPC-270C
Type: Alimant mobile
Réponse en fréquence: 20 Hz à 25 kHz
Tension de sortie: 3,2 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête
(9 m V à1 kHz
10 cm/s., zéro à vitesse 45° de crête[DIN 45 500])
Séparation de canal: 25 dB à 1 kHz
Equilibrage des canaux: En deçà de 2 dB à 1 kHz
Elasticité (dynamique): 10 x 10^{-6} cm/dyne à 100 Hz
Pression de la pointe de lecture: 1,75 ± 0,25 gramme (17,5 ± 2,5 mN)
Impédance de charge: 47 kΩ to 100 kΩ
Poids: 6,0 grammes (cellule seule)
Pointe de lecture de remplacement: EPS-270SD

■ CONTENTS

PARTS IDENTIFICATIONS 3
FEATURES 3
HOW TO OPERATE 4
DISASSEMBLY PROCEDURE 5
PARTS ARRANGEMENT DIAGRAM 6
ADJUSTMENTS . . . . . 7,8 & 9
BLOCK DIAGRAM 10
SCHEMATIC DIAGRAM . . . . . 11 & 12
PRINTED CIRCUIT BOARD . . . . . 13 & 14
REPLACEMENT PARTS LIST 15
ADJUSTMENT PROCEDURE 15
EXPLODED VIEWS . . . . . 16, 17 & 18
REPLACEMENT PARTS LIST 19

■ PARTS IDENTIFICATIONS



■ FEATURES

- **Front panel controls provide exceptional convenience**
- **Integral rotor/platter structure for stable rotation**
- **"TNRC"* base material provides an acoustic shield**
  "TNRC" . . . . .Technics Non-Resonance Compound
- **Low-mass, low-friction gimbal suspension tonearm**
- **Pitch control with illuminated stroboscope**
- **Viscous-damped cueing**
- **Anti-skating control**
- **Hinged, detachable dust cover**
- **Automatic tonearm return**

■ HOW TO OPERATE

1. Place a record on the turntable mat.
2. Set the speed select knob to the desired record speed. **(See Fig. 1.)**

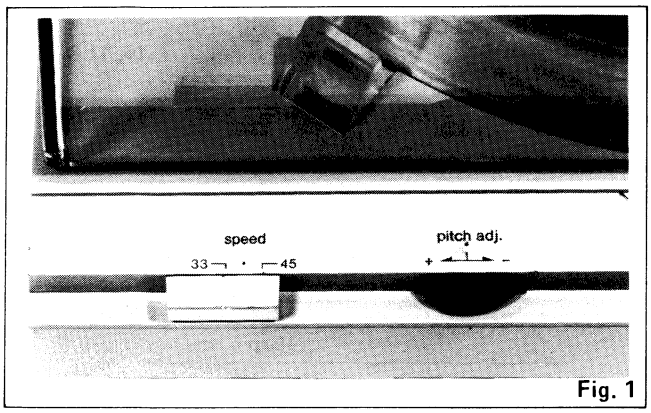


Fig. 1

3. Remove the stylus protector, if your cartridge has a detachable one.
4. Release the arm clamp.
5. Set the cueing lever to the "up" position. **(See Fig. 2.)**
6. Move the tonearm over the desired groove.
7. Set the cueing lever to the "down" position. **(See Fig. 3.)**
   The tonearm will descend slowly onto the record and play will begin.
   When play is finished, the tonearm will automatically return to the arm rest (auto-return), and the turntable platter will stop rotation.

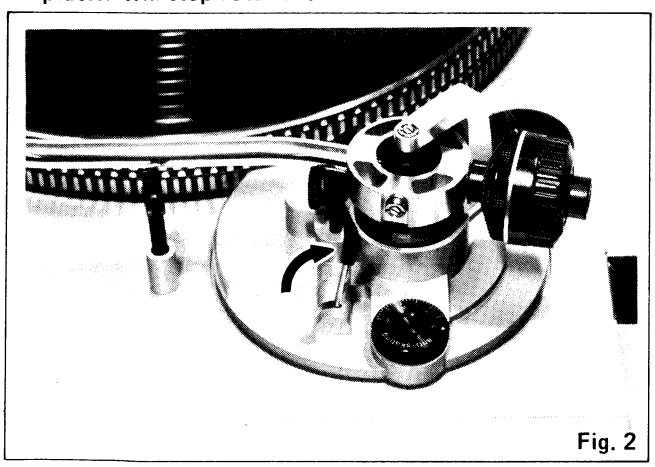


Fig. 2

Fig. 3

How to stop play

Push the stop button. **(See Fig. 4.)**
The tonearm automatically returns to the arm rest, and the turntable stops rotating.
Of course, the unit will automatically shut off even when the tonearm is manually returned to its arm rest directly.

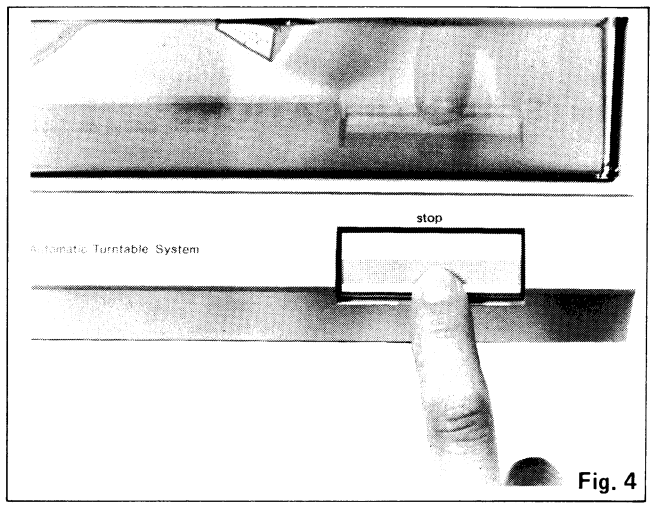


Fig. 4

How to suspend play

Set the cueing lever to the "up" position.
The stylus tip of the cartridge will be lifted from the record.

When you play a 45-rpm record with a large center hole

Place the 45-rpm adaptor on the center spindle. Set the speed select knob to the **"45"** position.

If the unit is not to be used for some time

Secure the tonearm with the arm clamp.
Attach the stylus protector, if your cartridge has one, to guard the stylus from damage.
Close the dust cover.

Lubrication (See Fig. 4-1.)

Apply 2 or 3 drops of oil once after every 2000 hours of operation.
The time interval is much longer than that for conventional type motors (200 – 500 hours).
Please purchase original oil. **(Part number is SFWO 010.)**

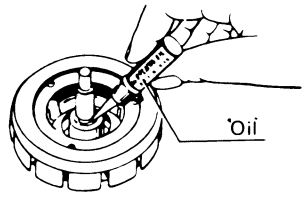


Fig. 4-1

■ DISASSEMBLY PROCEDURE

How to remove the bottom plate (Fig. 5)

1) Remove the head shell and turntable.
2) Secure the tone arm with the arm clamper.
3) Turn over the set taking care not to damage the dust cover.
4) Remove the 7 bottom plate setscrews Ⓐ.
   Note) Be careful not to lose the boss cap attached to the insulator on the cabinet side.

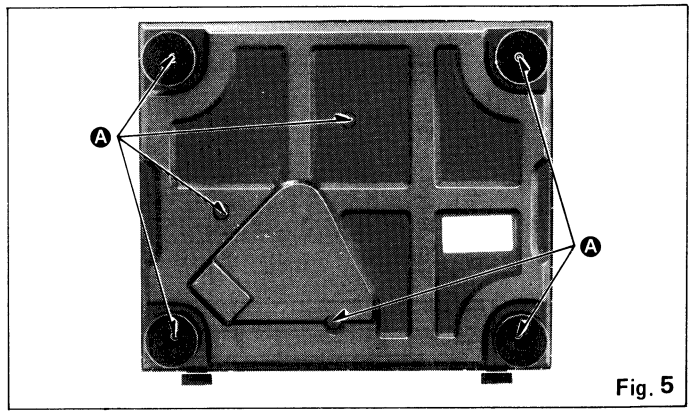


Fig. 5

How to remove the radiating fin (Fig. 6)

1) Remove the bottom board as explained above.
2) Remove the 4 setscrews Ⓑ of the radiating fin.
3) Remove the 2 setscrews Ⓒ of the top radiating fin.

Removal of drive P.C.B. and automatic mechanism ass'y (Fig. 6)

1) Remove the bottom board.
2) Remove the speed change knob.
3) Remove the 4 setscrews Ⓓ of the automatic mechanism ass'y.
4) Remove the 4 setscrews Ⓔ of the drive P.C.B..
5) Pull out the boards in the direction of the arrow ❶ as illustrated.
   Note) 1. Pull the start plate in the direction of the arrow ❷ because it may otherwise come in touch with the tone arm fixing plate ass'y.
   2. Since the neon cover is fixed being in contact with the drive P.C.B. take care not to lose the neon cover when removing the base palte.

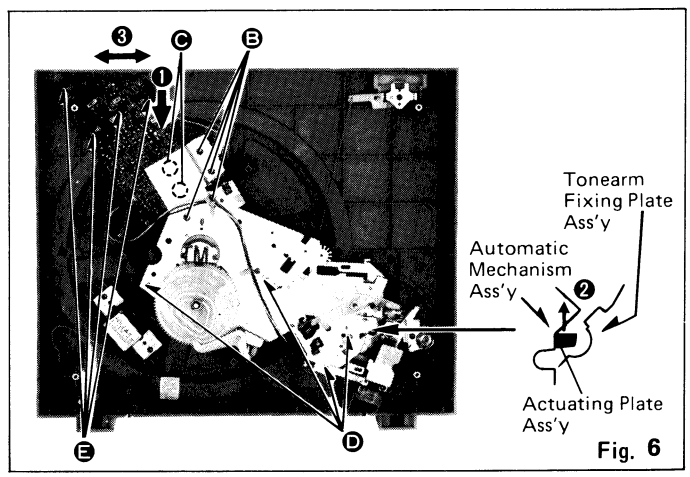


Fig. 6

Removal of stater coil (Fig. 7)

1) Remove the 3 setscrews of the stator cover of the removed drive P.C.B..
2) Disconnect the 18 soldered parts of the stater coil.
3) Remove the 3 setscrews Ⓕ of the stator coil and P.C.B. board.
   Then, the stater coil can be removed. When installing, position the stater coil as shown by the arrow ❹.

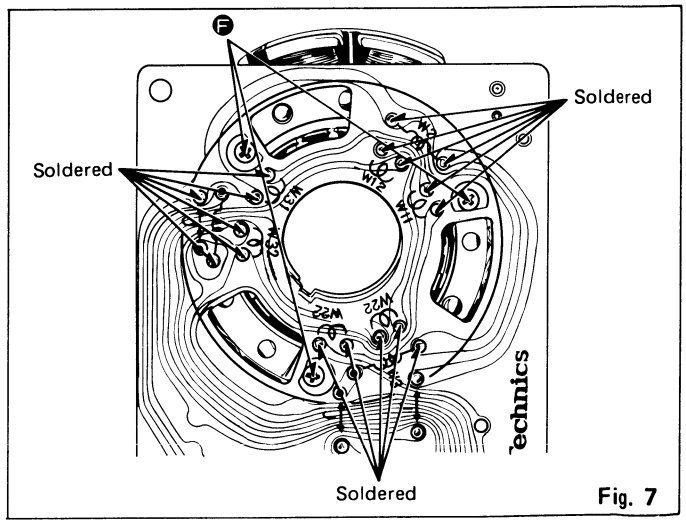


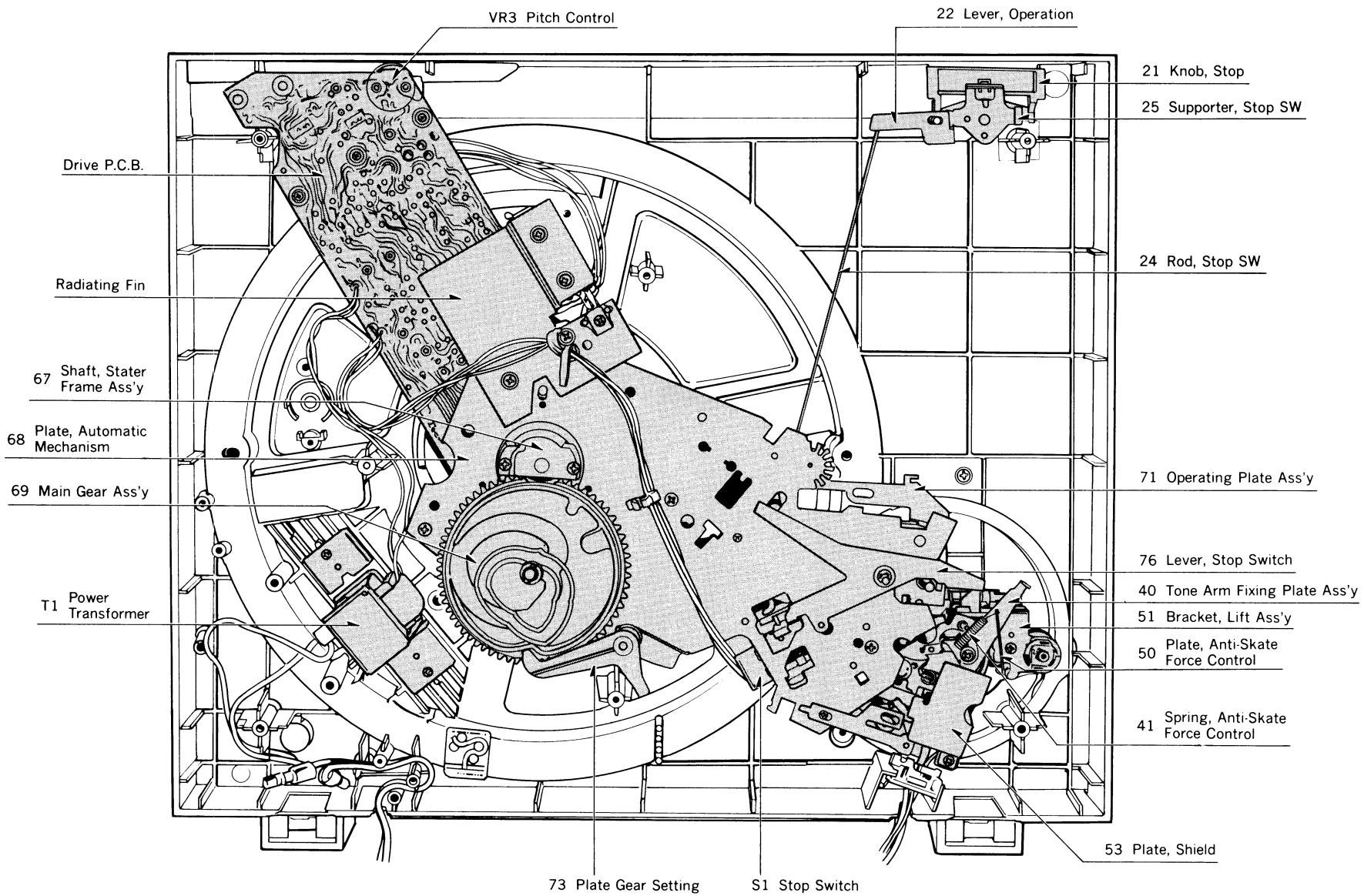
Fig. 7

Precautions for assembly

Note) When assembling the mechanical and drive P.C.B., follow the procedure below. (Fig. 6)

1) Temporarily secure the 3 setscrews of the stator coil.
2) Secure the automatic mechanism ass'y with 4 setscrews. (Pull the actuating plate ass'y in the direction of the arrow 2 or otherwise it may touch the tone arm fixing plate ass'y.)
3) There is some clearance between the drive P.C.B. and automatic mechanism ass'y in the direction of the arrow 3. Find a position where the pitch control knob doesn't touch the cabinet, and then install the drive base plate with 4 setscrews.

9 ■ PARTS ARRANGEMENT DIAGRAM



■ ADJUSTMENTS

Adjustment of the arm-lift height (See Figs 8 and 9.)

The arm-lift height (distance between the stylus tip and record surface when cueing lever is raised) has been adjusted at the factory before shipping to approximately 5 to 10 mm.

If the clearance becomes too narrow or too wide, turn the adjustment screw clockwise or counterclockwise, while pushing the arm lift down.

Clockwise rotation

–distance between the record and stylus tip is decreased.

Counterclockwise rotation

–distance between the record and stylus tip is increased.

Note:

As the adjusting screw has a hexagonal head, be sure to make the adjustment while depressing the arm lift, or the screw will not move freely.

Also be sure that the hexagonal head retracts correctly into the arm lift when the latter is released.

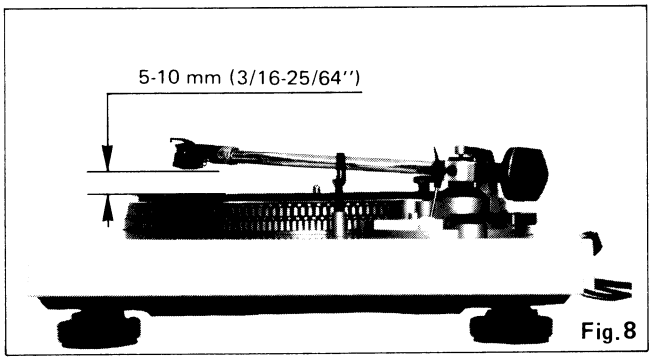


Fig. 8

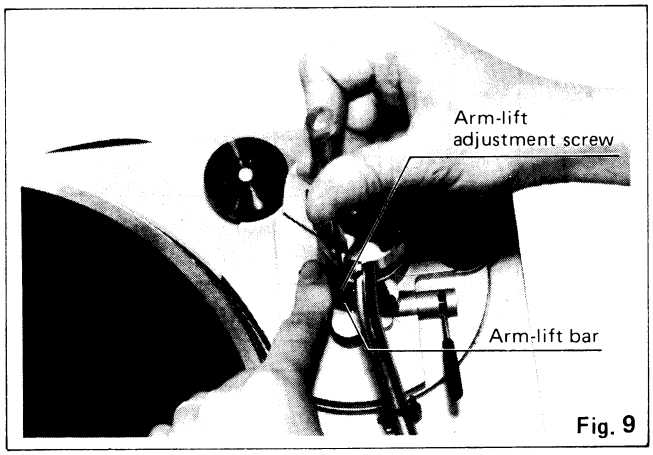


Fig. 9

Adjustment for automatic return position (See Fig. 10.)

(Remove the turntable mat.)

In cases where the tonearm tends to return before the playing has finished.

–rotate clockwise

In cases where the tonearm fails to return after the last groove of the record has been played.

–rotate counterclockwise

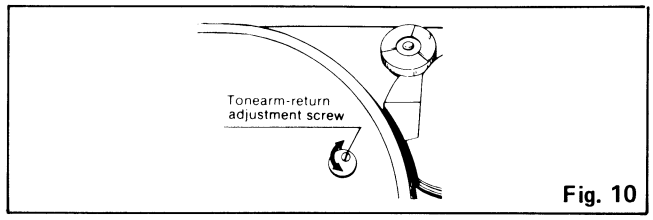


Fig. 10

Speed adjustment (with pitch-control knob) (See Fig. 11.)

Strobe dots are set on the rim of the turntable platter according to the power-line frequency and the speed of the records. Make adjustment, referring to the strobe-dot indication.

1. Set the speed select knob to the speed to be adjusted.
2. Release the arm clamp and move the tonearm toward the record.
   The strobe-illuminator/pilot lamp will light up and the turntable platter will rotate.
3. While turning the pitch-control knob either to the "+" side or "–" side, adjust so that the strobe dots of the turntable platter look as if they were stationary. This represents the correct speed.

"+" direction

The speed of the turntable platter will increase. Turn the knob in this direction if the strobe dots seem to be **"falling back"**, i.e. seem to be moving counterclockwise. When the dots appear to be stationary, turntable speed is accurate.

"–" direction

The speed of the turntable platter will decrease. Turn the knob in this direction if the dots seem to be **"running ahead"**, i.e. seem to be moving clockwise, until they appear stationary.

Moreover, the speed fine control knob can be used both for 33-1/3 rpm and 45 rpm.

Adjustment is to be made according to the selected speed (33-1/3 rpm or 45 rpm).

Note:

Strobe dot pattern

The strobe-illuminator/pilot lamp of this unit employs the standard commercial power source. The frequency of such power source, when actually measured, has a fluctuation of about 0.2%.

As such a fluctuation of the power source affects the strobe illuminator, the strobe dot pattern also seems to fluctuate to a certain extent. But the unit is not affected by these fluctuations of the power source, since a DC motor is employed.

In other words, rotation of the platter will be constant, and slight shifts in the movement of the dots simply reflect normal drift in the power-source frequency.

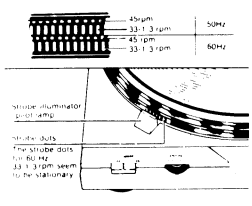


Fig. 11

■ JUSTIERUNGEN

Justierung der Tonarmlifthöhe (Vgl. Abb. 8 und 9.)

Die Tonarmlifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche, wenn der Lift-Hebel angehoben ist, ist werkseitig auf ungefähr 10 mm eingestellt worden.

Falls der Abstand zu groß oder zu klein wird, drehen Sie die Justierschraube im Uhrzeigersinn oder Gegenuhrzeigersinn während Sie die Tonarmliftführung nach unten drücken.

Drehung im Uhrzeigersinn

—Der Abstand wird kleiner.

Drehung im Gegenuhrzeigersinn

—Der Abstand wird größer.

Anmerkung:

Da die Justierschraube einen Sechskantkopf hat, muß die Tonarmliftführung während des Justierens unbedingt gedrückt gehalten werden, damit sich die Schraube leicht drehen läßt.

Vergewissern Sie sich, daß der Sechskantkopf in die Tonarmliftführung zurückkehrt, wenn diese losgelassen wird.

Justierung des Abschaltpunktes der Automatik (Vgl. Abb. 10.)

(Die Plattentellerauflage abnehmen.)

Falls der Tonarm zu früh zurückkehrt.

—Im Uhrzeigersinn drehen.

Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt.

—Im Gegenuhrzeigersinn drehen.

Drehzahl-Feineinstellung (mit dem Drehzahl-Feineinsteller) (Vgl. Abb. 11.)

Die Stroboskoppunkte sind auf dem Plattentellerrand entsprechend der Stromfrequenz und der Drehzahl der Schallplatten angebracht.

Richten Sie sich bei der Drehzahl-Feineinstellung nach dem Stroboskopbild.

1. Stellen Sie den Drehzahl-Wahlschieber auf die zu regulierende Drehzahl ein.
2. Lösen Sie die Tonarm-Arretierklammer, und schwenken Sie den Tonarm zur Schallplatte.
   Die Stroboskoplampe/Einschaltkontrolle leuchtet auf, und der Plattenteller dreht sich.
3. Regulieren Sie durch Drehen des Einstellknopfes in "+" oder "—" Richung solange, bis die Stroboskoppunkte den Anschein vermitteln, daß sie stillstehen. Dieser Zustand stellt die korrekte Drehzahl dar.
   "+" Richtung
   Die Drehzahl des Plattentellers erhöht sich. Drehen Sie den Knopf in diese Richtung, wenn die Stroboskoppunkte "zurückzufallen", d.h. im Gegenuhrzeigersinn zu fließen scheinen. Wenn die Punkte stillzustehen scheinen, ist die Geschwindigkeit korrekt.
   "—" Richtung
   Die Drehzahl des Plattentellers verringert sich. Drehen Sie den Knopf in diese Richtung, wenn die Stroboskoppunkte "vorauszueilen", d.h. im Uhrzeigersinn zu fließen scheinen. Regulieren Sie, bis sie stillzustehen scheinen.

Anmerkung:

Stroboskoppunktemuster

Die Stroboskoplampe/Kontrollampe dieses Gerätes arbeitet mit normalem Netzstrom. Die Netzfrequenzschwankungen liegen in einem Bereich von ungefähr ±0.2%.

Da eine solche Netzschwankung die Stroboskoplampe beeinflußt, scheint das Punktemuster auch zu einem gewissen Grad zu fließen. Die Drehzahl des Plattentellers wird jedoch durch diese Schwankung nicht beeinflußt, da ein Gleichstrommotor den Plattenteller antreibt. Anders ausgedrückt, die Umdrehungsgeschwindigkeit des Plattentellers bleibt konstant, und die geringfügige Bewegung der Stroboskoppunkte entspricht lediglich der normalen Schwankung der Netzfrequenz.

Einstellung der Drehzahl (vgl. Eig. 12)

Falls die Drehzahl durch Auswechseln von IC oder anderen Teilen sowie durch Drehen des Knopfes für Drehzahlfeinverstellung (VR3) sich nicht richtig einstellen läßt, die Nacheinstellung gemäß dem folgenden Verfahren vornehmen.

1. Den Knopf für Drehzahlfeinverstellung auf die Mitte stellen.
2. In Betriebsart 33-1/3 U/min VR1 (33) so drehen, daß die Drehzahl an Hand des Stroboskops auf den vorgeschriebenen Punkt eingestellt wird.
3. Anschließend in Betriebsart 45 U/min VR2 (45) so drehen, daß die Drehzahl an Hand des Stroboskops auf den vorgeschriebenen Punkt eingestellt wird.
4. Nach der Einstellung den Drehzahlwechselschalter umstellen und sich vertewissern, daß die Drehzahlen in den Betriebsarten von 33-1/3 und 45 U/min mit der jeweils vorgeschriebenen übereinstimmt.

Anmerkung:

Für die o.g. Einstellung erfolgt das Demontageverfahren. Die Bodenplatte entfernen und das Gerät zur Reparatur auf einen Tisch setzen, um Zugang von unten her zu gewinnen.

Es ist auch möglich, nur durch Entfernen der Drehscheibe das Gerät einsustellen.

Die Drehscheibe wie unten dargestellt entfernen, und durch das dann erscheinende Loch läßt sich ein Schraubenzieher einstecken, um VR1 und VR2 zu drehen.

■ REGLAGES

Mise au point de la hauteur de l'élévateur du bras (Voir Figs. 8 et 9.)

La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque lorsque le levier de relevage du bras est soulevé) a été réglée en usine avant son départ sur une valeur approximative de 10 mm. Si l'écartement devient trop étroit ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou en sens inverse, tout en abaissant l'élévateur du bras.

Rotation dans le sens des aiguilles d'une montre.

—La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.

Rotation dans le sens contraire des aiguilles d'une montre.

—La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.

Nota:

Comme la vis de réglage posséde une tête hexagonale, s'assurer d'effectuer la mise au point tout en abaissant l'élévateur du bras, sinon la vis ne bougera pas librement. Vérifier aussi que la tête hexagonale se retire correctement dans l'élévateur du bras quand ce dernier est libéré.

Mise au point pour une position de retour automatique (Voir Fig. 10.)

(Retirer le tapis du plateau de lecture.)

Dans le cas où le bras de lecture tend à revenir avant que l'audition ne soit terminée.

—Déplacer dans le sens des aiguilles d'une montre.

Dans le cas où le bras de lecture ne peut revenir en arrière après que le dernier sillon du disque ait été joué.

—Déplacer dans le sens contraire des aiguilles d'une montre.

Réglage de la vitesse (avec la manette de réglage de précision) (Voir Fig. 11.)

Les points du stroboscope sont réglés sur le bord du plateau du tourne-disque en fonction de la fréquence de réseau et de la vitesse des disques.

Il faut effecture le réglage de la vitesse en se référant aux indications des points du stroboscope.

1. Régler la manette sélectrice de vitesse sur la vitesse devant être mise au point.
2. Libérer le clip de retenue du bras et déplacer le bras de lecture vers le disque.
   La lampe-témoin/illuminomètre stroboscopique s'éclairera et le plateau commencera à tourner.
3. Tout en tournant la manette de réglage de précision suffisamment, soit dans le sens "+" soit dans le sens "—", ajuster de façon à ce que les points du stroboscope du plateau paraissent stationnaires.
   Cet état représente la vitesse correcte.
   Sens "+"
   La vitesse du plateau augmentera. Tourner la manette dans cette direction si les points stroboscopiques semblent "**reculer**". c.-à-d. se déplacer dans le sens inverse des aiguilles d'une montre. Lorsque les points paraissent immobiles, la vitesse du plateau est exacte.
   Sens "—"
   La vitesse du plateau diminuera. Tourner la manette dans cette direction si les points stroboscopiques semblent "**s'écouler vers l'avant**", c.-à-d. se déplacer dans le sens des aiguilles d'une montre, jusqu'à ce qu'ils paraissent stationnaires.

Nota:

Image des points stroboscopiques.

La lampe-témoin/illuminomètre stroboscopique de cet appareil utilise une alimentation commerciale standard. La fréquence d'une pareille source d'énergie, lorsqu'elle est effectivement mesurée, montre une variation d'à peu prés 0.2%.

Comme une telle variation de la source d'énergie affecte l'illuminomètre stroboscopique, l'image des points stroboscopiques semble varier aussi sur une certaine étendur. Mais l'appareil n'est pas affecté par ces variations de la source d'énergie, étant donné qu'un moteur à courant continu est utilisé.

En d'autres mots, la rotation du plateau restera constante et les légers déplacements dans le mouvement des points ne reflétent simplement qu'une déviation normale dans la fréquence de la source d'énergie.

Reglage de la vitesse (Voir la Fig. 12)

Si la vitesse de rotation ne peut pas être correctement réglée par le remplacement du C.I. ou d'autres éléments et en tournant le bouton (VR3) de réglage fin de la vitesse, refaire le réglage en suivant le procédé suivant.

1. Placer le bouton de réglage fin de la vitesse, sur la position centrale.
2. Dans le mode 33-1/3 t/pm, tourner le VR1 (33) de telle sorte que la vitesse soit réglée sur le point spécifié par l'utilisation du stroboscope.
3. Puis, dans le mode 45 tours, tourner le VR2 (45) de telle sorte que la vitesse soit réglée sur la point spécifié, par l'utilisation du stroboscope.
4. Après ce réglage, déplacer le commutateur de changement de vitesse et s'assurer que les vitesses sont celles qui ont été spécifiées dans les modes 33-1/3 et 45 tours.

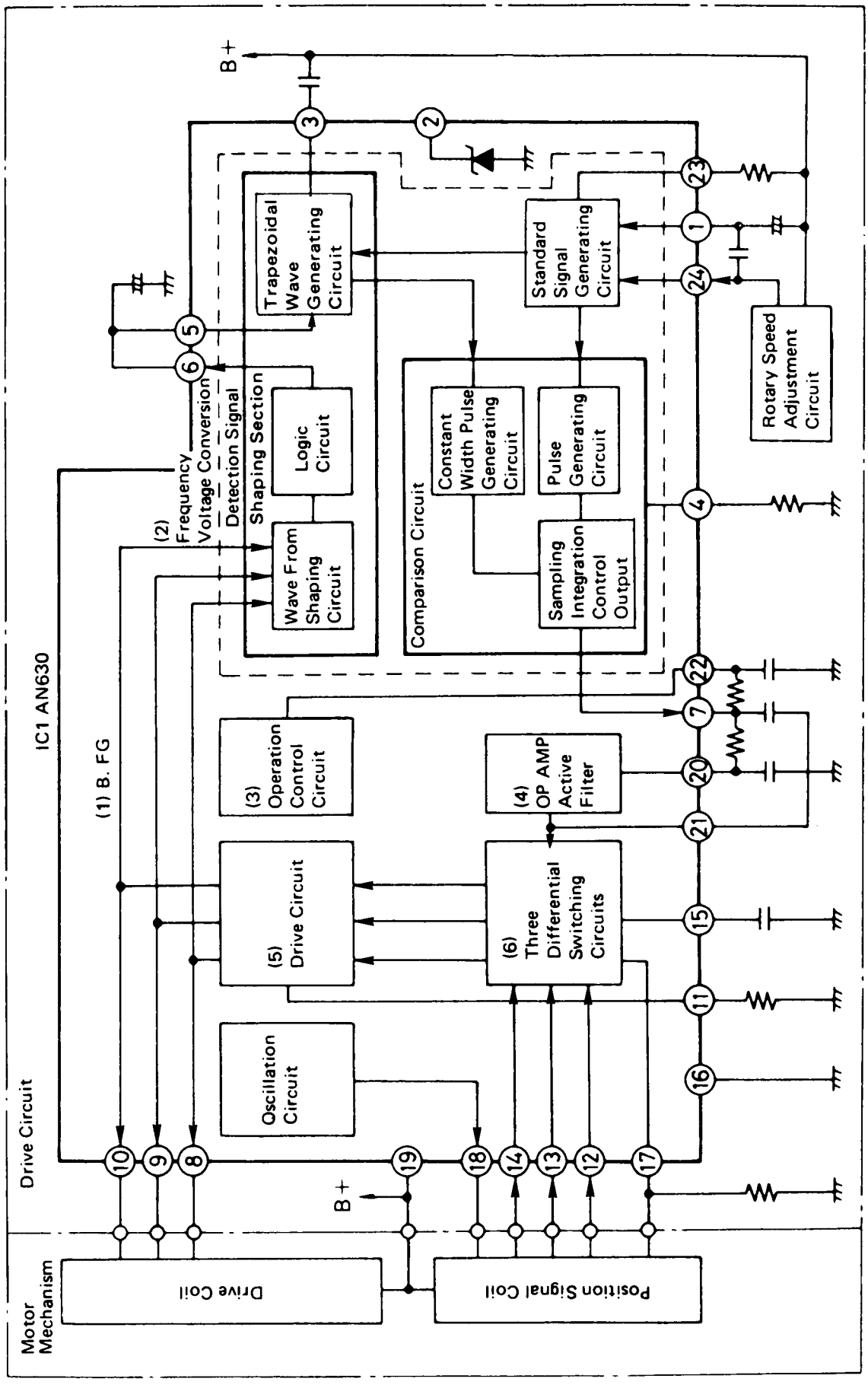
Note:

Pour les réglages suivants, suivre les procédés de dépose. Pour les travaux de réparation, enlever la plaque de base et placer l'appareil sur une table et accéder à l'appareil par dessous.

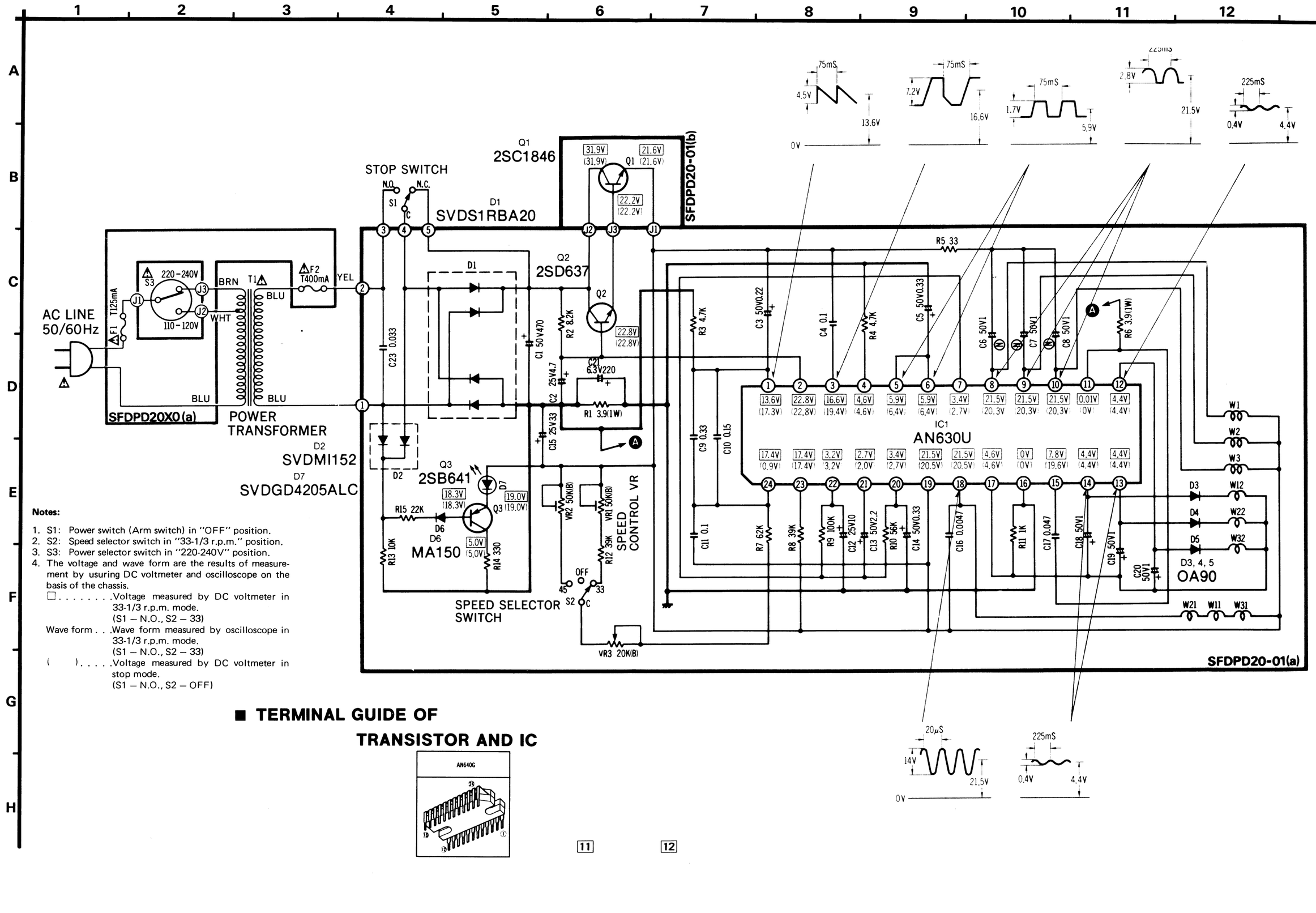
Il est aussi possible de régler l'appareil après avoir seulement enlevé son tourne-disques.

Enlever le tourne-disques comme le montre l'illustration ci-dessous, puis un orifice apparaîtra par lequel un tournevis peut être introduit pour tourner les VR1 et VR2.

■ BLOCK DIAGRAM



Schematic Diagram (This schematic diagram may be modified at any time with the development of new technology.)



Notes:

1. S1: Power switch (Arm switch) in "OFF" position.
2. S2: Speed selector switch in "33-1/3 r.p.m." position.
3. S3: Power selector switch in "220-240V" position.
4. The voltage and wave form are the results of measurement by usuring DC voltmeter and oscilloscope on the basis of the chassis.

□. . . . . .Voltage measured by DC voltmeter in 33-1/3 r.p.m. mode. (S1 – N.O., S2 – 33)

Wave form . . .Wave form measured by oscilloscope in 33-1/3 r.p.m. mode. (S1 – N.O., S2 – 33)

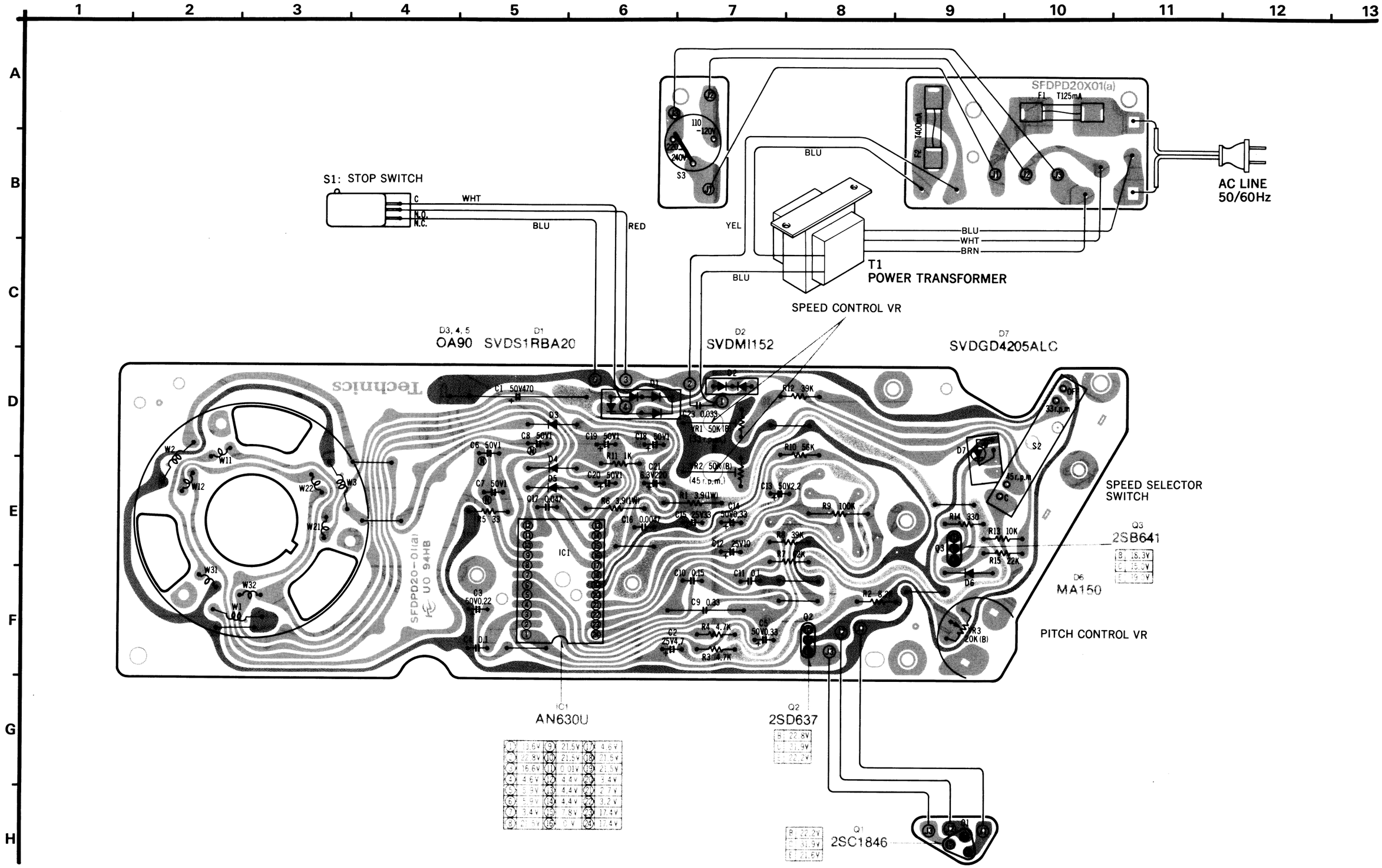
( ). . . . .Voltage measured by DC voltmeter in stop mode. (S1 – N.O., S2 – OFF)

■ TERMINAL GUIDE OF TRANSISTOR AND IC

11 12

Printed Circuit Board

Earth (Ground) lines
B lines



■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. ⚠ indicates that only parts specified by the manufacture be used safety.
3. SL-D2 (XA)⟶[XA], SL-D2 (XAL)⟶[XAL], SL-D2 (XGE)⟶[XGE], SL-D2 (E)⟶[E], SL-D2 (XG)⟶[XG]
SL-D2 (XGF)⟶[XGF], SL-D2 (XGB)⟶[XGB], SL-D2K (XAL)⟶[KXAL], SL-D2K (E)⟶[KE],
SL-D2K (XG)⟶[KXG], SL-D2K (XA)⟶[KXA]

Ref. No.		Part No.	Part Name & Description
INTEGRATED CIRCUIT			
IC1		AN630U	Integrated Circuit
TRANSISTORS			
Q1		2SC1846-R	Transistor
Q2		2SD637	Transistor
Q3		2SB641	Transistor
DIODES			
D1	⚠	**SVDSIRBA40**	Rectifier
D2	⚠	SVDMI152	Rectifier
D3, 4, 5		**2OA90**	Diode
D6		**MA161**	Diode
D7, 9		SVDGD4205ALC	Light Emitting Diode
TRANSFORMER			
T1	⚠	SLT5352A	Power Transformer
FUSE			
F1	⚠	XBA2C012TRO	125mA, Fuse
F2	⚠	XBA2C04TRO	400mA, Fuse
SWITCHES			
S1	⚠	SFDSAH74403	Switch, Power
S2		EVAH27SBCAAY	Switch, Speed Selector
S3	⚠	SFDSHXW13312	Switch, Power Selector
VARIABLE RESISTORS			
VR1, 2		EVLS6AA00B54	50kΩ (B), Speed Control (33 r.p.m. & 45 r.p.m.)
VR3		EVJ61AT12B24	20kΩ (B), Pitch Control

Ref. No.		Part No.	Part Name & Description
RESISTORS			
R1		**ERX1ANJ3R9**	Metallic, 3.9Ω, 1W, ± 5%
R2		**ERD25FJ822**	Carbon, 8.2kΩ, 1/4W, ± 5%
R3, 4		**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R5		**ERD25FJ330**	Carbon, 33Ω, 1/4W, ± 5%
R6		**ERX1ANJ3R9**	Metallic, 3.9kΩ, 1W, ± 5%
R7		**ERO25CKF6202**	Metal Film, 62kΩ, 1/4W, ± 1%
R8		**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ± 5%
R9		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R10		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%
R11		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R12		**ERO25CKF3902**	Metal Film, 39kΩ, 1/4W, ± 2%
R13		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R14		**ERD25FJ331**	Carbon, 330Ω, 1/4W, ± 5%
R15		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
CAPACITORS			
C1		**ECEB1HS471**	Electrolytic, 470μF, 50V
C2		**ECEA25Z4R7**	Electrolytic, 4.7μF, 25V
C3		**ECEA50ZR22**	Electrolytic, 0.22μF, 50V
C4		ECQM1H104KS	Polyester, 0.1μF, 50V, ±10%
C5		**ECEA50ZR33**	Electrolytic, 0.33μF, 50V
C6, 7		**ECEA50N1**	Non-polar Electrolytic, 1μF, 50V
C8		**ECEA50N1**	Non-polar Electrolytic, 1μF, 50V
C9		ECQF2334KZ	Polypropylene, 0.33μF, 200V, ±10%
C10		ECQM1H154KZ	Polyester, 0.15μF, 50V, ±10%
C11		ECQM1H104KS	Polyester, 0.1μF, 50V, ±10%
C12		**ECEA25M10R**	Electrolytic, 10μF, 25V
C13		**ECEA50M2R2R**	Electrolytic, 2.2μF, 50V
C14		**ECEA50MR33R**	Electrolytic, 0.33μF, 50V
C15		**ECEA1VS330**	Electrolytic, 33μF, 25V
C16		ECQM1H472KZ	Polyester, 0.0047μF, 50V, ±10%
C17		ECQM1H473KZ	Polyester, 0.0047μF, 50V, ±10%
C18, 19		**ECEA50Z1**	Electrolytic, 1μF, 50V
C20		**ECEA50Z1**	Electrolytic, 1μF, 50V
C21		**ECEA1AS221**	Electrolytic, 220μF, 6.3V
C23		ECQM1H333KZ	Polyester, 0.0033μF, 50V, ±10%

■ ADJUSTMENT PROCEDURE

Adjustment of Speed (See Fig. 12)

If the number of revolutions cannot be correctly adjusted by replacing IC or other parts and turning the fine speed adjusting knob (VR3), make the re-adjustment according to the following procedure.

1. Set the fine speed adjusting knob to the central position.
2. In 33-1/3 r.p.m. mode, turn VR1 (33) so that the speed is adjusted to the specified point by using a stroboscope.
3. Next, in 45 r.p.m. mode, turn VR2 (45) so that the speed is adjusted to the specified point by using a stroboscope.
4. After the adjustment, shift the speed change switch and make sure that the speeds in 33-1/3 r.p.m. and 45 r.p.m. modes are as specified.

Note:
For the above adjustments, follow the disassembly procedure. Remove the bottom plate and put the set on a table for repair work and gain access to it from underneath.

It is also possible to adjust the set only with its turntable removed.
Remove the turntable as illustrated below, then a hole will be revealed from which a screwdriver can be inserted to turn VR1 and VR2.

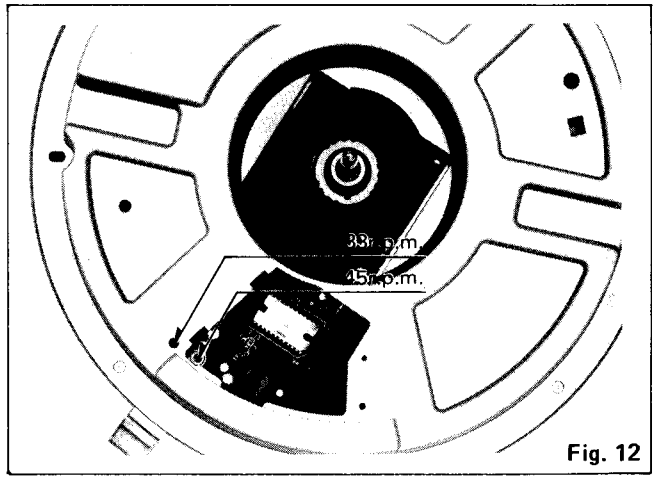
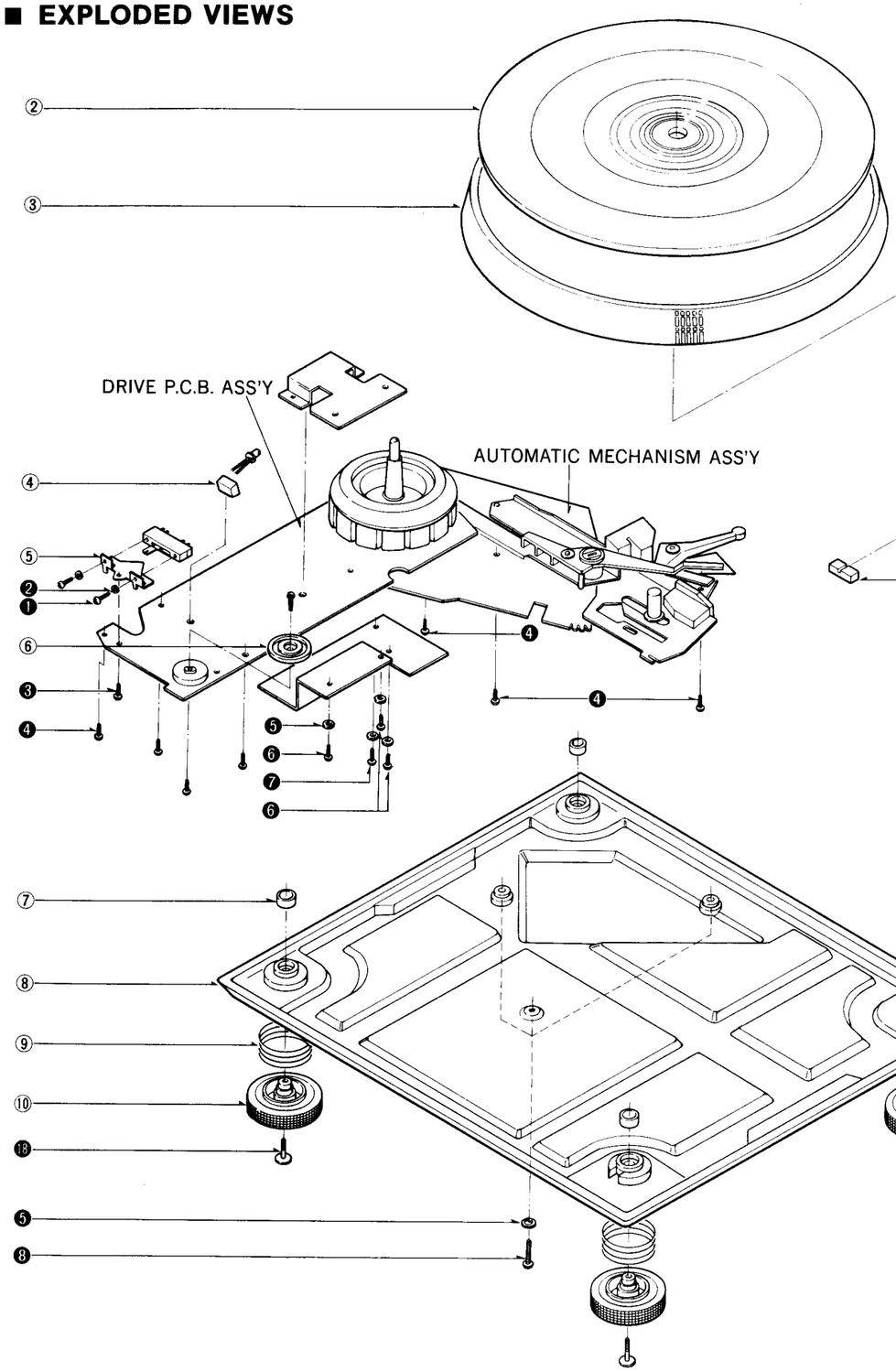
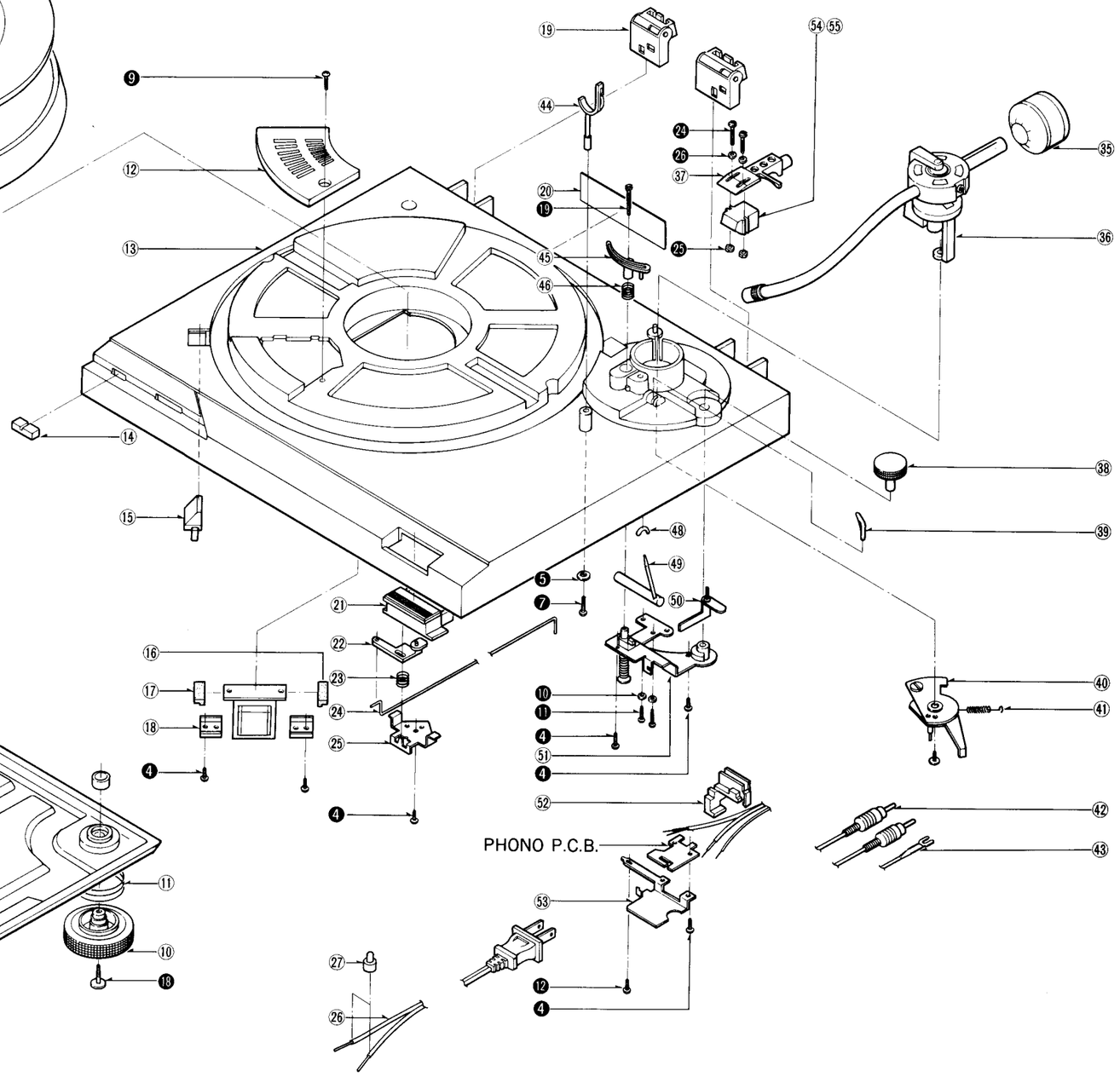


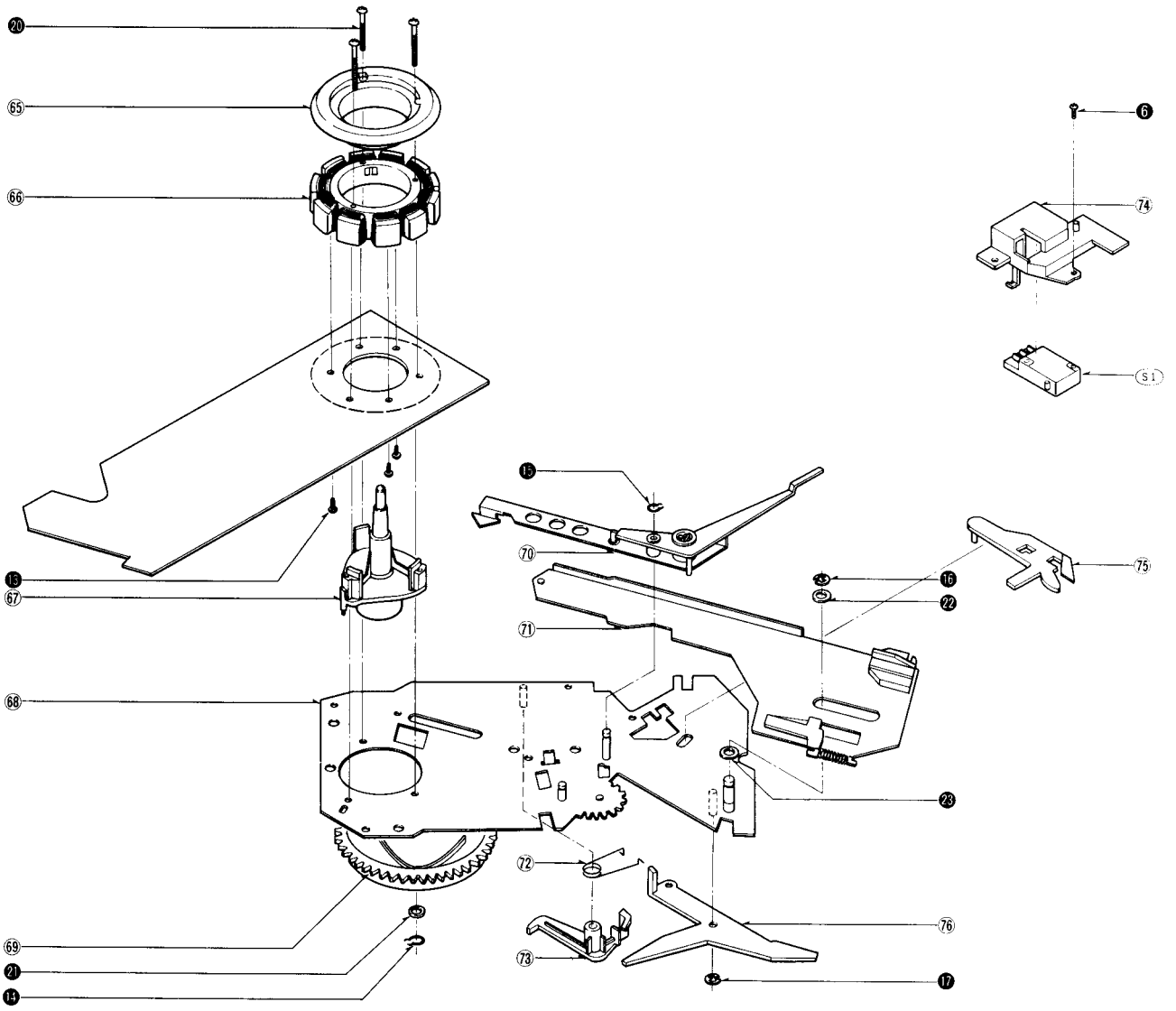
Fig. 12

■ EXPLODED VIEWS





■ EXPLODED VIEWS



■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. ⚠ indicates that only parts specified by the manufacture be used safety.
3. SL-D2 (XA)⟶[XA], SL-D2 (XAL)⟶[XAL], SL-D2 (XGE)⟶[XGE], SL-D2 (E)⟶[E], SL-D2 (XG)⟶[XG]
SL-D2 (XGF)⟶[XGF], SL-D2 (XGB)⟶[XGB], SL-D2K (XAL)⟶[KXAL], SL-D2K (E)⟶[KE],
SL-D2K (XG)⟶[KXG], SL-D2K (XA)⟶[KXA]

Ref. No.		Part No.	Part Name & Description
CABINET and CHASSIS PARTS			
1		SFADD20-01E	Dust Cover
2		SFTG320-01	Turntable Mat
3		SFTED20-01A	Turntable
4		SFUMD20-02	Spacer, LED
5		SFUPD20-04	Plat, Speed Select Switch
6		SFKTD20-03	Knob, Pitch Control
7		SFXWD20-01	Cap, Bottom Board
8		SFAUQ20-01	Bottom Board
9		SFQC200-02	Spring, Audio Insulator (Front)
10		SFGAQ20-01E	Audio Insulator
11		SFQC320-01	Spring, Audio Insulator (Rear)
12		SFKCD20-01	Panel, Cabinet
13 [XA, XAL, XGE, E, XG, XGF, XGB]		SFACD20-01	Cabinet
13 [KXAL, KE, KXG, KXA]		SFACD20K01	Cabinet
14		SFKTD20-02	Knob, Speed Select
15		SFUMQ20-05	Cover, Neon
16		SFGCD20-01	Cushion, Power Transformer
17		SFGCD20-02	Cushion, Power Transformer
18		SFUPD20-02	Supporter, Power Transformer
19		SFAT301-01A	Hinge Ass'y
20 [XA, XG, XGF XGB, KXA]		SFNND20X01	Name Plate
20 [XAL, XGE]		SFNND20G01	Name Plate
20 [KXAL]		SFNND20K01	Name Plate
20 [E]		SFNND20S01	Name Plate
20 [KE]		SFNND20K02	Name Plate
20 [KXG]		SFNND20K03	Name Plate
21		SFKTD20-01	Knob, Stop
22		SFUMD20-01	Lever, Operation
23		SFQAD20-01	Spring, Stop SW
24		SFUZD20-01E	Rod, Stop SW
25		SFUPD20-03	Supporter, Stop SW
26 [except XAL, XGE, KXGE]	⚠	RJA23ZC-K	AC Cord
26 [XAL, KXAL]	⚠	QFC1208M	AC Cord
26 [XGE] only	⚠	RJA45ZC-K	AC Cord
27	⚠	SJE41	Spacer, AC Cord
TONE ARM and ARM BASE			
35		SFPWG31101K	Balance Weight
36 [XA, XAL, XGE, E, XG, XGF, XGB]		SFPAM31101K	Tone Arm
36 [KXAL, KE, KXG, KXA]		SFPAM31102K	Tone Arm
37		SFPCC31001K	Headshell
38		SFPJK13101	Knob, Anti-skate Force Control
39		SFPAB13202	Knob, Cueing Lever
40		SFUPQ20-03A	Tone Arm Fixing Plate Ass'y
41		SFPSP00101	Spring, Anti-skate Force Control
42		SFDH212-01	Phon Cord
43		SFEL028-01E	Ground Wire
44		SFKU212-01E	Arm Rest
45		SFPRT13004K	Lift Ass'y
46		SFQA829-03	Spring, Lift Ass'y
48		SFGZD20-02	Supporter, Cueing
49		SFPJL00101K	Lever, Cueing
50		SFXJQ20-03E	Plate, Anti-skate Force Control
51		SFUPD20-01A	Bracket, Lift Ass'y
52		SFUM212-08	Clamper, Cord
53		SFUP683R04	Plate, Shield
54 [except XGF]		EPC270C2K-X	Cartridge
55 [except XGF]		EPS270ED	Stylus
AUTOMATIC MECHANISM ASS'Y			
65		SFMGQ20-01	Cover, Stater Frame Ass'y
66		SFMG170-01A	Stater Frame
67		SFMZQ20-01A	Shaft, Stater Frame Ass'y
68		SFUKD30-11E	Plate, Automatic Mechanism
69		SFUG190-22E	Main Gear Ass'y
70		SFUCQ20-11E	Actuating Plate Ass'y
71		SFUBQ30-11A	Operating Plate Ass'y
72		SFQS222-11	Spring, Gear Setting
73		SFUM222-11	Plate, Gear Setting
74		SFUMQ20-18	Cover, Stop Switch
75		SFUMQ20-16	Supporter, Stop Switch
76		SFUMQ20-17	Lever, Stop Switch
SCREWS, WASHERS and CIRCLIPS			
❶		XSN2+4	Screw
❷		**XWA2B**	Washer
❸		**XTN3+5B**	Screw
❹		**XTV3+10B**	Screw
❺		**XWG3**	Washer
❻		**XTV3+8B**	Screw
❼		**XTV3+14B**	Screw
❽		**XTV3+20B**	Screw
❾		**XTV3+10BFZ**	Screw
❿		**XWA3B**	Washer
⓫		**XSN3+12S**	Screw
⓬		**XTN3+8B**	Screw
⓭		**XTN26+6B**	Screw
⓮		XUB6FT	Circlip
⓯		XUB4FT	Circlip
⓰		**XUC5FT**	Circlip
⓱		**XUC3FT**	Circlip
⓲		SFXGD20-01	Screw
⓳		SFXG829-01	Screw
⓴		SFXGQ20-02	Screw
㉑		SFXW890B01	Washer
㉒		SFXW623-02	Washer
㉓		SFXW130-13	Washer
㉔ [except XGF]		SFPEV9801	Screw
㉕ [except XGF]		SFPEN3302	Nut
㉖ [except XGF]		SFPEW9601	Washer
ACCESSORIES			
A1 [XA, XAL, KXAL, XG, KXG, XGF, XGB, KXA]		SFNUD20X01	Instruction Book
A1 [XGE]		SFNUD20G01	Instruction Book
A1 [E, KE]		SFNUD20S01	Instruction Book
A2		SFWE212-01	Adaptor, 45 r.p.m.
A3 [XGF] only		SFPEN3302	Nut , Cartridge
A4 [XGF] only		SFPEW9601	Washer, Head Shell
A5 [XGF] only		SFCZV8801	Screw, Cartridge
A6 [XGF] only		SFPEV9801	Screw, Cartridge
A7 [XGF] only		SFYF05A06	Polyethylene Bag
A8 [XGF] only		SFK0135-01	Overhang Gauge
A9		SFPZB3501	Shell Weight
PACKING PARTS			
P1 [XA, XAL, XGE, E, XG, XGB]		SFHPD20M01	Carton
P1 [KXAL, KE, KXG, KXA]		SFHPD20K01	Carton
P1 [XGF]		SFHPD20C01	Carton
P2		SFHHD20-01	Pad, Front
P3		SFHHD20-02	Pad, Rear
P4		SFHD230-01	Pad, Top
P5		SFHDD20-02	Pad, Turntable
P6		SFYH60X60	Polyethylene Cover, Player Unite
P7		SFYH60X60	Polyethylene Cover, Dust Cover
P8		SFYH40X45	Polyethylene Cover, Turntable
P9		SFHSD20-01	Spacer, Tone Arm

— NOTE —

Printed in Japan
79057800 S.H.

ORDER NO. SD7906-1577

Service Manual

SL-D2/K

Turntable System

SL-D2K

(FEE)

SL-D2

(XFE), (ES)

* The model SL-D2K (FEE) is available in European Audio Club only.
* The model SL-D2 (XFE) is available in East PX only.
* The model SL-D2 (ES) is available in European Military only.

* SL-D2K is of black finish.
* SL-D2 is of silver finish.

For additional information, please refer to the service manual for Model No. SL-D2/K (ORDER NO. SD7905-1561)

Notes: * This service manual includes only the changes of the **SL-D2/K** service manual **(ORDER NO. SD7905-1561)**
* When servicing models **SL-D2K (FEE)/SL-D2 (XFE, ES)** this service manual and **SL-D2/K (ORDER NO. SD7905-1561)** service manual should be used together.

MODIFICATIONS-1

■ SPECIFICATIONS (Page 1)

Cartridge section

Model No.	EPC-270C
Type:	Moving magnet
Frequency response:	20 Hz to 25 kHz
Output voltage:	3.2 mV at 1 kHz 5 cm/s. zero to peak lateral velocity
Output voltage:	[9 mV at 1 kHz 10 cm/s. zero to peak 45° velocity (DIN 45 500)]
Channel separation:	25 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Compliance (dynamic):	10×10^{-6} cm/dyne at 100 Hz
Stylus pressure:	1.75 ±0.25g (17.5 ±2.5mN)
Load impedance:	47 kΩ to 100 kΩ
Weight:	6.0 g (cartridge only)
Replacement stylus:	EPS-270SD

➡

Cartridge section

Type:	Moving magnetic stereo cartridge
Frequency response:	20 to 25,000 Hz
Output voltage:	2.5 mV 1 kHz, 5 cm/sec. zero to peak lateral velocity (3.5 mV 1 kHz, 5 cm/sec. zero to peak 45° velocity)
Channel separation:	22 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Load impedance:	47 kΩ to 100 kΩ
Stylus pressure:	1.75 ± 0.25 kg
Replacement stylus:	EPS-74STED (ATN71E)

Technics

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
17-15, 6-chome, Shinbashi, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

MODIFICATIONS-2

■ REPLACEMENT PARTS LIST (Page 19)

* SL-D2/K (FEE) → [KFEE]
* SL-D2 (XFE) → [XFE]
* SL-D2 (ES) → [ES]

Ref. No.	Change of Part No. SD7905-1561 → SL-D2/K (FEE) SL-D2 (XFE), (ES)		Part Name & Description
	CABINET and CHASSIS PARTS		
13	SFACD20-01	SFACD20-01 [ES], [XFE]	Cabinet
	SFACD20K01	SFACD20K01 [KFEE]	Cabinet
20	SFNND20X01	SFNND20X01 [KFEE]	Name Plate
	SFNND20G01		
	SFNND20K01		
	SFNND20S01	SFNND20E01 [ES], [XFE]	Name Plate
	SFNND20K02		
	SFNND20K03		
26	RJA23ZC-K	SJA83	AC Cord
	QFC1208M		
	RJA45ZC-K		
27	SJE41	Deletion	----------
	TONE ARM and ARM BASE		
36	SFPAM31101K	SFPAM31101K [ES], [XFE]	Tone Arm
	SFPAM31102K	SFPAM31102K [KFEE]	Tone Arm
54	EPC270C2K	EPC74SMED	Cartridge
55	EPS270ED	EPS74STED	Stylus
	SCREWS , WASHERS and CIRCLIPS		
㉔	SFPEV9801	SFPEV7803	Screw
	ACCESSORIES		
A1	SFNUD20X01	SFNUD20P01	Instruction Book
	SFNUD20G01		
	SFNUD20S01		
A10	Addition	QJP0603S	Adaptor, Gimens
	PACKING PARTS		
P1	SFHDP20M01	SFHPD20M01 [ES], [XFE]	
	SFHPD20K01	SFHPD20K01 [KFEE]	
	SFHPD20C01		

Printed in Japan
79060950④S.H.

ORDER NO. SD8001-T056

Technical Information

FILE THIS BULLETIN WITH YOUR SERVICE MANUAL.

Turntable System

SL-D2
SL-D2K

Subjects: Moving trouble of Tone Arm.

Contents: If you get the moving trouble of Tone Arm, such as stylus jumpping on the record or abnormal operation.
In case of pick-up rotation table and panel are touched due to pick-up installation lug.
In the case, please follows under method.

Normal Condition: Fig. (1)

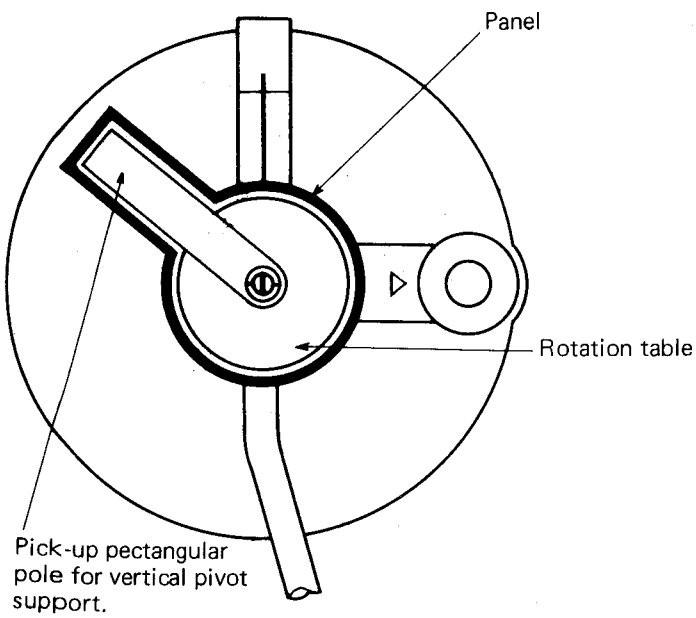


Fig. (1)

Abnormal Condition: Fig.(2)

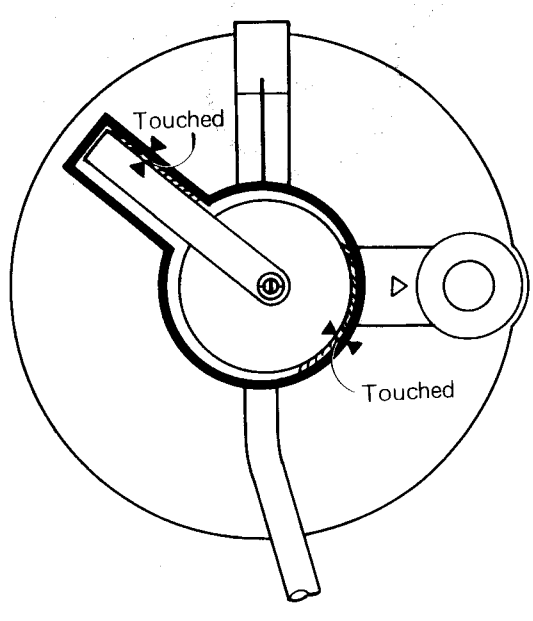


Fig. (2)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Remedy Method (1)

(A): Please insert the 0.5mm special metal spacer between pick-up pectangular pole for vertical pivot support and panel.
Firstly, please push the points (A) as an arrow direction by hand, so about 0.5mm space will come out at point (B). Then insert the 0.5mm special metal spacer to that space as show in fig. 3. In that time, please be careful the scratch of pick-up pectangular pole because of prastic.

(B): After repairing, please inspect the Tone Arm operation at least once.

Remedy Method (2) – If it can't solve the above trouble by method (1).

(A): Please remove the complete pick-up after removed bottom cover.

(B): Then insert the additional 0.3mm nilon washer (SFXWD20-02) to pick-up install part (point A) as shown in fig. 4.

(C): After method (2), please fix the pick-up in unit completely.

(D): After installation and repairing, please inspect the Tone Arm operation and sound.

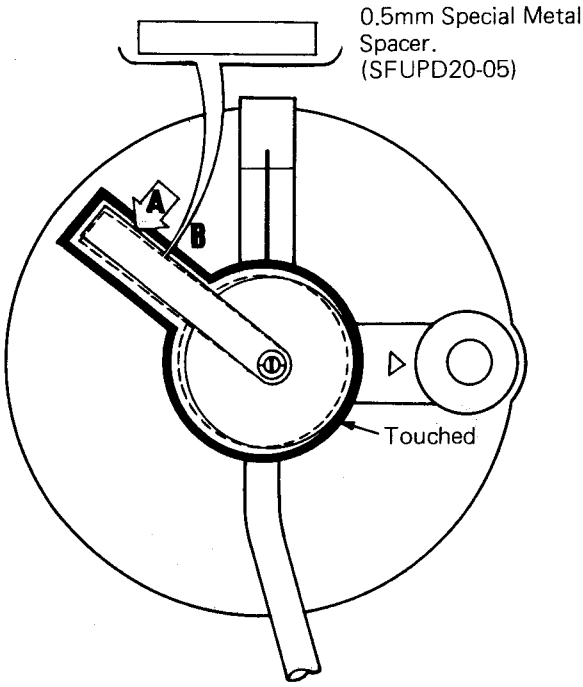


Fig . 3

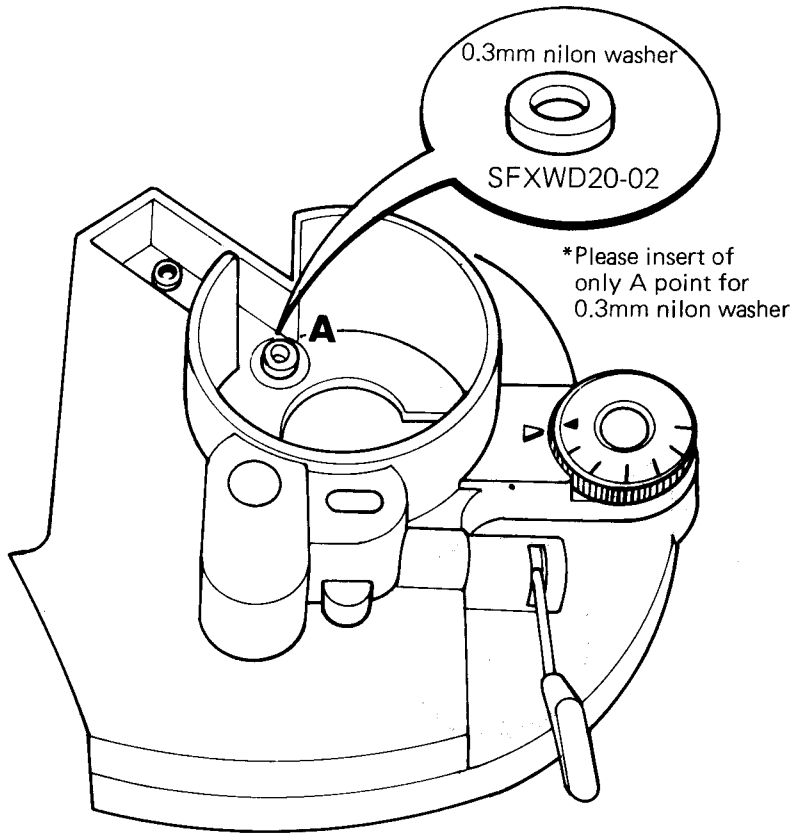


Fig. 4

* We would like to supply 0.5mm special metal spacer (SFUPD20-05) and 0.3mm nilon washer (SFXWD20-02) from OSD as soon as possible, please kindly inform us when you need.

Printed in Japan
8001-6800@S-N